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G-000-101.30

**ESTABLISHMENT OF NET AND WMCO
LABORATORIES FOR THE ANALYSIS OF
SAMPLES COLLECTED TO SUPPORT THE RI/FS**

05/31/91

**DOE-1412-91
DOE-FSO/EPA
2
LETTER**



1394

Department of Energy

Fernald Site Office
P.O. Box 398705
Cincinnati, Ohio 45239-8705
(513) 738-6319

MAY 31 1991

DOE-1412-91

Ms. Catherine A. McCord
Remedial Project Manager
U. S. Environmental Protection Agency
Region V - 5HR-12
230 South Dearborn Street
Chicago, IL 60604

Mr. Graham E. Mitchell, DOE Coordinator
Ohio Environmental Protection Agency
40 South Main Street
Dayton, OH 45402

Dear Ms. McCord and Mr. Mitchell:

**ESTABLISHMENT OF NET AND WMCO LABORATORIES FOR THE ANALYSIS OF SAMPLES
COLLECTED TO SUPPORT THE RI/FS**

- Reference: 1) Letter, C. A. McCord to J. R. Craig, "Removal #3 Work Plan Parts II and III U. S. DOE - Fernald OH6 890 008 976," dated April 24, 1991
- 2) Letter, C. A. McCord to J. R. Craig, "Removal #2 Pit Storm Water Work Plan Mod Submittal U. S. DOE Fernald OH6 890 008 976," dated April 15, 1991

In response to Reference 1 concerning the use of the NET and WMCO Laboratories to perform pre-excavation sample analysis to support the Waste Pit Storm Water Removal Action, an evaluation of the NET Laboratory has been conducted and the results are enclosed. In order to provide clarification and hopefully obtain your approval for the use of these laboratories the following is provided:

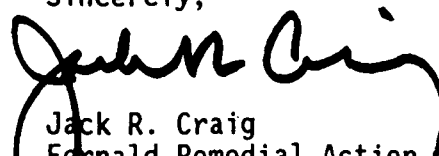
1. The WMCO operated laboratory at the FMPC can conduct radiological analysis and screening activities, which will meet Data Quality Assurance Level II per U. S. EPA SW-846. The laboratory is capable of accomplishing higher quality analysis, but has not been evaluated against Contract Laboratory Program (CLP) equivalent procedures. At a later date, after an independent evaluation of the laboratory is complete, the use of the on-site laboratory may be expanded with your approval.

FERNALD'S MAIN PRIORITY IS CLEANUP

2. The NET Laboratory has been evaluated and although has never participated in the CLP can provide equivalent analyses at or near that level. Based on the conducted audit it has been determined that the NET Laboratory is capable of performing HSL analyses, which will meet Data Quality Assurance Level III per U. S. EPA SW-846. It is our intention to work with the NET Laboratory to expand their capabilities in meeting FMPC requirements.
3. Neither the NET Laboratory or the Site Laboratory are analyzing U. S. EPA Performance Evaluation (PE) samples and therefore no results can be provided.

We hope that this transmittal will provide adequate information for you to allow the use of these two laboratories to support the RI/FS process. If you have any questions, please contact Oba Vincent at (513) 738-6937 or FTS 774-9637.

Sincerely,


 Jack R. Craig
 Fernald Remedial Action
 Project Manager

FSO:Vincent

Enclosure: As stated

cc w/encl.:

J. J. Fiore, EM-42, GTN
 K. A. Hayes, EM-424, GTN
 L. August, GeoTrans
 K. Davidson, OEPA-Columbus
 M. Butler, USEPA-V, 5CS-TUB-3
 J. Benetti, USEPA-V, 5AR-26
 E. Schuessler, PRC
 R. L. Glenn, Parsons
 W. H. Britton, WMCO
 H. F. Daugherty, WMCO
 S. W. Coyle, WMCO
 J. D. Wood, ASI
 AR Files

cc w/o encl.:

C. R. Holmes, USEPA-HQ
 W. E. Muno, USEPA-V, 5HR-13
 D. A. Ullrich, USEPA-V, 5H-12
 D. R. Schregardus, OEPA-Columbus

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**FEED MATERIALS PRODUCTION CENTER
Remedial Investigation/Feasibility Study**

May 2, 1991

Mr. Bobby Davis
Contracting Officer's Representative
U.S. Department of Energy
P.O. Box 398705
Cincinnati, OH 45239-8705

Dear Mr. Davis:

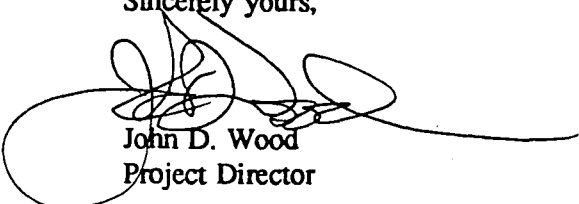
Subject: NET Laboratories, Dayton, Ohio, Vendor Source Evaluation - Soil Analysis Evaluation

Reference: April 17, 1991 Letter John Wood to Bobby Davis

Attached is additional evaluation information for analytical services of the NET Laboratories, Dayton, Ohio, in regard to their ability to perform to the RI/FS QAPP and report in CLP format. The evaluation is for soil analysis reporting limits which were supplied by NET Laboratories.

The evaluation was requested by DOE and WMCO and is for information purposes only and no return response is required.

Sincerely yours,



John D. Wood
Project Director

JDW:LAS:dm

LAS2285DM5

Attachments

cc:	J. Craig, DOE	D. Kasperek, WMCO
	O. Vincent, DOE	R. Skalka, WMCO
	D. Carr, WMCO	W. Hertel, IT
	H. Daugherty, WMCO	J. Razor, IT
	D. Hoover, WMCO-QA	Project File 7.2



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11003 HAMILTON CLEVES ROAD • P.O. BOX 475 • ROSS, OHIO 45061 (513) 738-3100



Vendor Source Evaluation

5-01-91

Addendum for NET Midwest Labs - Vendor Source Evaluation on 4-8-91 at the direction of Westinghouse Material Company of Ohio (WMCO), a vendor source evaluation was performed at the NET Laboratories and facilities in Dayton, Ohio by Advanced Sciences Inc. (ASI).

Pursuant to this audit, additional reporting limits for metals in soil have been supplied by NET - Midwest Laboratories in Dayton for review.

The reporting limits provided are based on a typical sample size of one gram (1.0 g) soil which is diluted to 100 ml for analysis. Soil reporting limits are related to those for water, but may vary from sample to sample due to differences in weights of sample and % moisture content.

Table II lists the reporting limits provided for soils along with the minimum detection limits (MDLs) from the FMPC RI/FS QAPP. Starred elements are those which do not meet the required detectability under the QAPP.

Table I lists the reporting limits for water. Required reporting limits were also reviewed and are identical to the Dayton limits with the exception of vanadium which will be reported to 50 $\mu\text{g}/\ell$ instead of 10 $\mu\text{g}/\ell$. Furnace reporting limits for lead and silver were 5 $\mu\text{g}/\ell$ and 1 $\mu\text{g}/\ell$, respectively. These are slightly higher than the MDL for lead, and less than the MDL for silver.

TABLE I
REPORTING LIMITS, NET MIDWEST, DAYTON DIVISION
WATER

<u>Element</u>	<u>Reporting Limit</u> (ug/L)	<u>MDL, from QAPP</u> ug/L
*Aluminum	500	200
Antimony	20	60
Arsenic	5	10
*Barium	500	200
*Beryllium	50	5
*Cadmium	50	5
Calcium	1000	5000
*Chromium	40	10
*Cobalt	200	50
*Copper	50	25
Iron	100	100
*Lead	100	3
*Magnesium	1000	5000
*Manganese	40	15
Mercury	0.2	0.2
*Nickel	100	40
Potassium	1000	5000
Selenium	5	5
*Silver	40	10
Sodium	1000	5000
Thallium	10	10
Vanadium	10	10
*Zinc	50	20
Cyanide	5	10

*Reporting limit does not meet QAPP-required detection limit

TABLE II
REPORTING LIMITS, NET MIDWEST, DAYTON DIVISION
SOILS/SOLID SAMPLES

<u>Element</u>	<u>Reporting Limit</u> (mg/kg)	<u>MDL, from QAPP</u> mg/kg
*Aluminum	50	20
Antimony	2.0	2.0
Arsenic	0.50	2.0
*Barium	50	20
*Beryllium	5.0	1.0
*Cadmium	5.0	1.0
*Calcium	100	20
*Chromium	4.0	2.0
Cobalt	0.50	2.0
*Copper	5.0	2.0
Iron	10.0	20
Lead	0.50	1.0
*Magnesium	100	20
*Manganese	4.0	2.0
*Mercury	0.16	0.10
*Nickel	10.0	6.0
*Potassium	100	20
Selenium	0.50	1.0
Silver	4.0	0.10
*Sodium	100	20
Thallium	1.0	2.0
Vanadium	5.0	10.0
*Zinc	5.0	2.0

*Reporting limit does not meet QAPP-required detection limit

ENCLOSURE

1394

**FEED MATERIALS PRODUCTION CENTER
Remedial Investigation/Feasibility Study**

April 17, 1991

Mr. Bobby Davis
Contracting Officer's Representative
U.S. Department of Energy
P.O. Box 398705
Cincinnati, OH 45239-8705


Dear Mr. Davis:

Subject: NET Laboratories, Dayton, Ohio Vendor Source Evaluation

Attached is the Vendor Source Evaluation and the completed checklist used for ASI's evaluation of the NET Laboratories, Dayton, Ohio on April 8, 1991. The evaluation was performed at the request of Westinghouse Materials Company of Ohio and at the direction of the U.S. EPA Region V.

The evaluation is for information and use by the DOE and WMCO and requires no further review or response.

Sincerely,


John D. Wood
Project Director

JDW:LAS:dm

LAS2229DM5

Attachment

pc: Jack Craig, DOE
Oba Vincent, DOE
Dennis Carr, WMCO
Hugh Daugherty, WMCO
Don Hoover, WMCO-QA

Dick Kasperek, WMCO
Robert Skalka, WMCO
William Hertel, IT
John Razor, IT
Project File 7.2



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On 4-8-91 at the direction of Westinghouse Material Company of Ohio (WMCO), a Vendor Source Evaluation was performed at the NET Laboratories and facilities in Dayton, Ohio by Advanced Sciences Inc. (ASI). The evaluation was to review the NET laboratories and processes to determine if the Vendor could perform to RI/FS QAPP and U.S. EPA CLP protocols for FMPC samples sent in for analysis. ASI was represented by Larry Sexton, Project Quality Officer and Carleton Edmunds, Senior Scientist. WMCO was represented by Technical Representatives William Hayes and Michele Miller. The evaluation began at 11:00 am at the NET Laboratories. NET Laboratories was represented by Jackie Webster Division Manager, John Andrejcio, Project Manager, Nancy Scott, Laboratory Manager, Ken Hunt, QA/QC Coordinator and several area supervisors. After the initial introductions, a review of the scope of the evaluation and an ASI prepared checklist was presented to the NET staff. The evaluation began with a comprehensive tour of the NET Laboratory facilities.

The following completed checklist (see attached) and technical evaluation summary is presented for WMCO review.

Technical Evaluation of Laboratory

Purpose of Visit

The main purpose of this visit was to determine general laboratory capabilities to perform under the FMPC RI/FS QAPP, and the ability to report in CLP format parameters analyzed for on the Hazardous Substances list (HSL).

General Impressions

The general impression of working conditions at NET Midwest were very good. All lab areas were clean and well organized, with sufficient work space for analysis performed. Work areas appear to be well isolated, with specific areas for sample receiving and separate sample prep areas for metals, organics and routine chemical analysis. Instrumentation was separated by into analysis groups such as AA for metals, FIA for nutrients and routine chemical, IC, volatiles, GC/MS and pesticides. Organics analysis was performed in a building separate from organics prep and general chemistry.

Laboratory organization was configured to include a separate QA officer who was not in the direct line of supervision of the laboratory. Personnel training records were well documented, training included both vendor supplied and in house training programs. A safety program was in place which included a Haz-Com program, MSDS files and notification of potential hazards associated with samples - either known or discovered upon analysis.

Standard Operating Procedures (SOPs) were in place for most activities, and is an ongoing upgrading activity at NET. It was noted, however that SOPs were missing for sample receipt and handling, and calibration acceptance criteria for GC, and GC/MS.

The laboratory has adopted a QA program to assess performance under EPA Good Laboratory Practices (GLP). It was noted however that screening techniques were not in place for organics analysis which are susceptible to cross contamination from over-injection of high-range samples. A gas chromatograph is apparently in the lab's expansion budget to address this need.

Laboratory Capabilities

General

The CLP requires that instrumentation detection limits (IDLs) be determined on a quarterly basis to demonstrate that detection limits specified by the QAPP are being met or exceeded. It was noted during the review that the Dayton lab is not currently performing this function for all parameters at the required frequency and may not be tracking performance with adequate documentation suitable for CLP.

The FMPC RI/FS QAPP requires that all calibration standards be NBS traceable. For metals analysis, calibration verification standards were being used from an independent source, but neither was known to be NBS traceable. For organic analysis, standards were supplied by Supelco, but were not known to be NBS traceable.

All glassware used was found to be class "A" where applicable, and conforms to the QAPP requirements.

The laboratory is not licensed by NRC to receive samples that exceed regulatory limits for radioactivity. The laboratory is certified by the Ohio EPA to analyze for gross alpha and beta, Uranium and Radium 226, 228 in drinking water.

The laboratory will be limited to some degree in the samples it can receive due to NRC restrictions for receiving potentially radioactive samples. Other deficiencies noted do not affect the laboratory's ability to conform to specific QAPP/CLP requirements.

Metals Analysis

The Dayton lab does not currently have the capability to analyze samples by Inductively Coupled Plasma Spectroscopy (ICP) as required by the FMPC RI/FS QAPP. The lab did have seven (7) AAs, which were available for analysis and dedicated for furnace, flame and hydride techniques.

The potential difficulties which may be encountered are that sample throughput is adversely affected and minimum detectable quantities may be higher based on laboratory reporting limits for water (see table I). ICP has the advantage over conventional AA in that multiple elements may be analyzed for in a single run, which reduces the time requirements for analyzing a variety of elements.

It was noted during the review that the laboratory was currently operating at approximately 75-80% of capacity (based on revenues) and should be considered when submitting samples for extensive metals analysis.

It was also noted from an examination of the Dayton Division Statement of Qualifications that the several analyte reporting limits were higher than the minimum detection limits required in the QAPP. During the review, it was indicated that NET was currently in the process of evaluating their limits to reflect uniform reporting within NET systems. When received, these should be re-evaluated to determine compatibility with QAPP requirements.

Other quality control measures were consistent with the QAPP with the exception of interference check samples which are required to be analyzed by ICP.

Volatile Organics Analysis

All of the instrument requirements were either met or exceeded for volatiles analysis.

The minimum reporting limits for the lab are adequate when compared to the MDLs required by the QAPP. As with metals, the reporting limits should be re-examined when the revised limits are released by NET (See table I).

Quality control measures currently comply with QAPP/CLP requirements.

Semi-Volatile Organics Analysis

All of the instrument requirements were either met or exceeded for semi-volatiles analysis.

The minimum reporting limits of the lab (water) are adequate when compared to the MDLs required by the RI/FS QAPP. These should be re-examined when new limits are released.

Quality control measures currently comply with QAPP/CLP requirements.

Pesticide / PCB Analysis

All of the instrument requirements were either met or exceeded for the analysis of pesticides and PCBs.

The minimum reporting limits for water meet the QAPP requirements for PCBs, but not for organochlorine pesticides (see table I).

The laboratory does not currently employ quality control measurements to the extent required by the QAPP. Specific deficiencies include absence of surrogate recoveries and evaluations for each sample analyzed (currently 10%) and tracking of GC system performance through Endrin linearity checks and DDT absolute retention (>12 min). While noted, it is not beyond the capability of the laboratory to comply with all QAPP/CLP requirements.

Laboratory Reporting Abilities

The laboratory does not currently report in CLP format. NET is in the process of upgrading software available to the Dayton facility which will enable CLP format reporting in the near future for all parameters.

Software is currently in place for the GC/MS section and QA/QC information is currently obtained in CLP format even though it is not reported.

For other parameters (metals, pesticides), the required quality control measures are in place, but reporting would be difficult due to the need for transcribing data into CLP format. Manual transcription would generate errors which would then require verification. Once data has been transcribed and verified, CLP packages must then be manually assembled and checked for completeness. Without appropriate resources, reporting quality and timeliness will likely be affected.

SUMMARY:

Routine Inorganics - full capabilities noted, CLP reporting format not required

Metals - Limited capabilities noted, QAPP MDLs may not be obtainable since ICP methodology is not available. Reporting may be difficult due to lack of appropriate software, CLP format reporting is possible.

Volatiles - Full capabilities noted. Laboratory has current ability to report in CLP format. QAPP detection limits can be met.

Semi - Volatiles - Full capabilities noted. Laboratory has current ability to report in CLP format - QAPP detection limits can be met.

Pesticides / PCB - Current practices do not conform to CLP requirements, but full capability is possible. Ability to report in CLP format may be limited. Detection limits for organochlorine pesticides may not meet QAPP requirements.

TABLE I
REPORTING LIMITS, NET MIDWEST, DAYTON DIVISION

taken from NET Midwest Statement of Qualifications

Element	Reporting Limit ¹ (ug/L)	MDL, from OAPP ² (ug/L)
*Aluminum	500	200
Antimony	20	60
Arsenic	5	10
*Barium	500	200
*Beryllium	50	5
*Cadmium	50	5
Calcium	1000	5000
*Chromium	40	10
*Cobalt	200	50
*Copper	50	25
Iron	100	100
*Lead	100	3
Magnesium	1000	5000
*Manganese	40	15
Mercury	0.2	0.2
Molybdenum	10	not established
*Nickel	100	40
Potassium	1000	5000
Selenium	5	5
*Silver	40	10
Sodium	1000	5000
Thallium	10	10
Vanadium	10	10
*Zinc	50	20
Cyanide	5	10
Volatile Organic	0.5 - 5.0	5-10
Semi-Volatile Org	4.0	10-50
*Pesticides/PCBs	0.5	0.05-1.0

*Reporting limit does not meet QAPP requirement

1. "Statement of Qualifications" NET Midwest, Dayton Division Summary of Reporting limits and Methodology.

NOTE: Limits listed are for water/wastewater. Reporting limits for soil or other matrices are not given and should be determined. Actual detection limits obtainable maybe less than the reporting limits adopted by the laboratory.

2. QAPP Minimum detection limits (MDL's) are for water/wastewater. Limits for soil or other matrices may be higher. Actual laboratory ability to comply with QAPP (MDL) requirements should be determined.

CHECKLIST FOR LABORATORY AUDIT
NET, DAYTON DIVISION 4-08-91



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SOP (Y/N) Check

 Z
 1
 Z
 1
 1
 1
 Z
 1
 1

Sample receipt

- Log in procedures sample logs - written logbook for potable water
- Sampling tracking (internal/external) - no tracking program
- Variance reports/procedures (condition on receipt) - noted on CC
- Work area isolation - good
- Chain of possession - not documented
- Transfer to labs, etc. - by analysis
- Sample storage/disposal - samples stored in hallway to labs /CMW
- Worker protection, safety procedures
- Inspection of receiving area - clean, orderly, well organized

Sample Prep

 Z

- Isolation of labs, work areas - all areas ok

- Routines
- Metals
- Organics (extractables)
- VOAs
- Others

 Z
 Z

- Isolation/storage of samples - OK, metals in hallway
- Storage of prepped samples/extracts
- Delivery to analysts

 Z
 1

- Variance reports/procedures - Noted in work sheets
- Glassware and cleanup - all glassware isolated by section
 - Conditions
 - Use of Class A glassware
 - Wash procedures - washing instructions were clear
 - Glassware blanks

 1

- Prep blanks

Quality Control Section

 1
 1
 1
 1
 Y
 Y
 Y
 Y

- QA officer - not in lab chain of command
- QC sample prep MS/MSD
 - Separate area? - no
 - Quality of SRMs used - not known to be NBS
- QC records (precision/accuracy)
 - Lab
 - Operator
 - Parameter

NOTE: QA program run from both laboratory and multi-laboratory level (Inter laboratory testing program ITP)



SOP (Y/N) Check

Records and Documentation

- -

- QA review - QA plan addresses, did not review specific areas
 - Compliance with holding time requirements
 - Return for re-analysis within holding times
 - Statistics evaluated and/or improved
 - Corrective procedures

- ✓

- Data evaluation for QC compliance - VOA data pkg only

- -

- CLP package - review contents/assembly

- -

- Data storage

- -

- Review of data entry for errors

Radiological

- ✓

- NRC permits to handle radioactive materials - none
 - gross A, B - Uranium - Radium in drinking water

Sample Disposal

- ✓

- Procedures used

- ✓

- Waste disposal contractor (Y/N) - yes

- ✓

- Handling/storage procedures - typically 30 days past reporting

- ✓

- Safety and training - on going S/T program

CLP Specific QC parameters

✓

- Instrument detection limits - currently being set for lab network

✓

- Organics

✓

- Inorganics not currently being maintained on a

- Other parameters quarterly basis

Inorganics

✓

- Initial/continuing calibration

✓

- Inorganics - every 10 samples

✓

- Blank evaluation

✓

- ICP interference check samples (min. 8 hrs.)

✓

- Matrix spike/matrix spike duplicates

✓

- Laboratory control samples (metals)

✓

- Std. addition for AA

✓

- Serial dilutions for ICP

Organics

✓

- DFTPP/BFB calibration (min. 12 hrs.)

✓

- Surrogate spike recoveries

✓

- Matrix spike/matrix spike duplicate analyses

✓

- Blank evaluation

- Initial and continuing calibration (RF, %RDS, %D)

SOP	(Y/N)	Check
		<ul style="list-style-type: none"> -Non compliance actions/documentation - noted on work sheets -Records maintained - yes, Audits performed on Q. basis -Inspection of records and work area - yes, Various parameters -Blind samples to labs - yes -Std checks - yes -QA manual - review -SOPs for operations and safety -MSDS/safety information -Library of lab reference documents - on file in central area and specific documents in labs -Methods of analysis -QAPPs -SOPs
<u>Sample Analysis</u>		
		<ul style="list-style-type: none"> -Separation/condition of laboratories - Individual labs are well separated -Routines -Extractables -Inorganics -Volatiles -Rad -Other -Biological -Separation of equipment - good -Condition of equipment - good -Daily calibration logs -Maintenance logs, routine -Injection logs -Repair logs, non-routine -Equipment updates -Service agreements - GC/MS only -Spare parts on hand - critical parts only -Original manufacturer spares -OEM from secondary suppliers -AA lamps -GC columns and supplies - prepacked -Other -Instrument calibration procedures -AA - calibration acceptance criteria not in SOP for GC/MS -GC -GC/MS -Survey of equipment available for lab use -Dedicated use? - yes -Multi use? - no -Multiple GC, GC/MS; AA, GFAA - yes -Condition of laboratories - good -Education, training of personnel -Familiarity with procedures/methods -E/T was well documented vendor supplied training -in-house training

Y VOA / BNA

Z PEST/PCB -Internal Std evaluation - not for each sample, currently
-Pesticide/PCB analysis 10% (pest/PCB)
Z -DDT RT > 12 in. and within RT windows
X -DDT/Endrin TTL breakdown <20%
Z -RT shift for DBC <2%
Z -Endrin Linearly check

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